

Report of research results

A. Title:

Risk of motor vehicle crash associated with pregnancy: comparison with non-pregnancy period

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C. Summary:

Background: Changes in the risk of motor vehicle crashes (MVCs) during pregnancy are less known, and very few studies assessed this issue using unselected population-based datasets and adopting a before-and-after design. The study aimed to address the risk of MVC events associated with the pregnancy based on a national pregnant women cohort in Taiwan.

Methods: A total of 1,372,664 pregnant women with live birth(s) at 18 to 50 years of age between 2008 and 2017 were identified from Taiwan's Birth Notification (BN) dataset. The same number of non-pregnant (control) women were randomly selected from all beneficiaries of Taiwan's National Health Insurance claim data by matching pregnant women on age and date of conception. MVC events as a driver were ascertained from the Police-reported Traffic Accident Registry (PTAR) datasets. We calculated the rate ratio (RR) with a 95% confidence interval (CI) using the conditional Poisson regression model to compare the MVC event rates between pre-pregnancy (i.e., 12 weeks prior to conception) and pregnancy periods for both pregnant and control women.

Results: The overall rate of MVC events significantly reduced after pregnancy (RR=0.69, 95% confidence interval (CI)=0.68-0.71). Reduced RRs were observed in nearly all sociodemographic stratifications, with the most and least reduction noted for mothers aged 18-24 years (0.49, 95% CI = 0.46-0.52) and mothers who were born outside Taiwan (0.87, 95% CI=0.77-0.98), respectively. Mothers with

alcoholism during pregnancy were associated with an increased RR at 2.00 but with a very wide CI. The reduction in RR was primarily attributable to the reduced MVC event rate involving scooter crashes (0.60, 95% CI=0.58-0.62). Unlikely the pregnant women, the control women showed a slightly increased RR (1.04, 95% CI=1.02-1.06) of MVCs in the same period.

Conclusion: Although MVC event rates reduced after women became pregnant, there were still many women drivers involving MVCs during pregnancy, whose potential maternal and perinatal conditions, along with their offspring's health outcomes, need further investigations.

D. Aim of Research

The study aimed to assess the risk of MVCs events during pregnancy and compared the risk of MVC events among pregnant women before and during pregnancy.

E. Method of Research & Progression

Taiwan Birth Notification (BN) dataset between 2008 and 2017 was linked to the Police-reported Traffic Accident Registry (PTAR) to identify the pregnant women involved in MVCs during their pregnancy. The number of victims who were motor-vehicle pregnant women were split into different road users (driver, passenger, and pedestrian) and vehicle types (car, scooter, and others) according to their gestational age and age at delivery. Also, we calculated the rate ratio (RR) with a 95% confidence interval (CI) using the conditional Poisson regression model to compare the MVC event rates between pre-pregnancy and pregnancy periods for both pregnant and control women.

F. Results of Research

Totally 22,134 (1.13%) women with MVCs during their pregnancy. Scooter (55%) is the majority reported vehicle type in MVCs. The number of MVCs events rapidly declined after 37 gestational weeks or maternal age above 42 years (Figure 1). Besides, the overall rate of MVC events significantly reduced after pregnancy (Table 1). Reduced RRs were also noted for overall and covariate-

specific stratifications, with the most and least reduction noted for mothers aged 18-24 years and mothers who were born outside Taiwan. Mothers with alcoholism during pregnancy were associated with an increased RR at 2.00 but with a very unreliable CI.

G. Future Areas to Take Note of and Going Forward

We found women had a reduced rate of MVCs after they became pregnant, and the decreased rate was sustained regardless of a woman’s socio-demographic characteristics. The reduction of MVC event rate after pregnancy was potentially elucidated by the changes in vehicle utilization and/or driving behaviors by pregnant women who recognize the potential danger of driving a car during pregnancy. Despite a reduction in the MVC event rate during pregnancy, there are still many pregnant women who encounter MVC events during pregnancy. It is therefore suggested that future research should be conducted to evaluate the potential effect of maternal and perinatal outcomes after MVC among pregnant women.

H. Means of Official Announcement of Research Results

The finding was one of the parts of Ya-Hui’s Ph.D. dissertation. We also presented the results of this project to the 2022 Taiwan Public Health Joint Annual Conference on October 14-16. We will revise and submit the manuscript to an international academic journal recently.

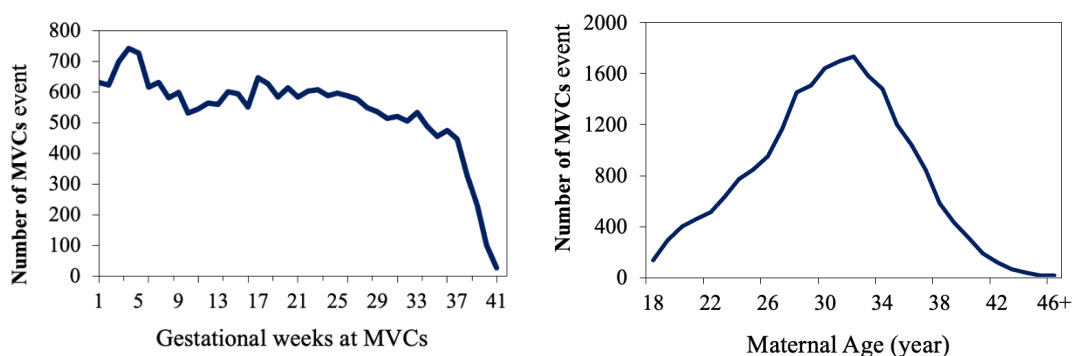


Figure 1. Number of MVCs events according to gestational weeks or maternal age at MVCs, in Taiwan, 2008-2017

Table 1. Comparison of MVCs event rate involving drivers before and during pregnancy among pregnant women.

