Shift work and injuries among police officers

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Objective: Research shows that shift workers, apart from being at risk for health-related problems, also suffer from work-related injuries and accidents. The objective of this study was to investigate the association between shift work and the incidence rate of injuries among police officers.

Methods: Study participants were employed at the Buffalo, New York Police Department at the time of sampling. In 1999, a random sample of 115 police officers was selected from all officers (n=934) in the department using a computer-generated random sample table. 100% of the random sample generated voluntarily agreed to participate in the study. Work history data, from 1994 to date of exam (1999-2000), were available for 111 of the 115 participants from payroll records of Buffalo police officers. One officer who was injured at the beginning of the study (prevalent case) was excluded leaving 110 participants available for analysis. The data contained a day-by-day account of shifts worked for each officer. Variables in the work history database included the start time of work, type of activity (regular work, court work, overtime work, etc), type of leave (sickness, workrelated injury, vacation, etc), and number of hours worked on each activity. The time participants started their work was used to classify participants into one of the following three shifts: day shift if start time ranged between 4 am and 11 am; afternoon shift if start time ranged between 12 pm and 7 pm; midnight shift if start time ranged between 8 pm and 3 am. Total hours worked as well as hours worked at day, afternoon and midnight shifts for regularly scheduled work were computed for each participant. In order to take into account varying lengths of time participants worked the computed hours were standardized to a weekly basis and percent of total hours worked on each shift was calculated. Officers were then classified into one of three shifts based on whichever shift had the largest percentage of hours worked for a given officer.

Officers who developed a work-related injury during the period of 1994 to date of examination were identified along with the date when the injury occurred. Person-time (total number of hours worked by all officers) at each of the three shifts was computed using work history data until date of first injury for those with an injury and using work history data until date of exam for those with no injury. Incidence rates of injury for each shift were computed as the number of participants with injuries that occurred in the specified shift divided by the total person-time for the shift. Injury incidence rates across the three shifts were then compared by computing incidence rate ratios (IRRs) and the corresponding 95% confidence intervals (CIs) using Poisson regression with day shift as the referent group. The Poisson regression method computes IRRs while accounting for time at risk and adjusting for potential confounders.

Results: A total of 31 injuries occurred among 110 officers over the approximate five year period. The overall injury incidence rate for the study population was 0.47 injuries per 10,000 person-hours (95% CI = 0.33-0.67). Incidence rates of injury on day, afternoon and midnight shifts, expressed per 10,000 person-hours, were 0.37 (95% CI = 0.19-0.64), 0.53 (95% CI = 0.26-0.94), and 0.68 (95% CI = 0.29-1.3) respectively. Although not significant, the unadjusted injury incidence rate for the midnight shift was about two-fold higher relative to the rate on the day shift (IRR = 1.86, 95% CI = 0.8-4.5), while the incidence rate on the afternoon shift was about 44% larger (IRR = 1.44, 95% CI = 0.6- 3.3). After adjusting for gender, education and alcohol consumption the IRRs were 2.9 (95% CI=1.1-8.4) for midnight vs. day shift and 1.9 (95% CI=0.8-4.6) for afternoon vs. day shift. Inclusion of age with the above covariates attenuated the association considerably; age, gender, education and alcohol consumption-adjusted IRR for night vs. day shift was 1.62 (95% CI =0.6-1.8) while IRR for afternoon vs. day was 0.97 (95% CI=0.4-2.6). Age varied significantly across shift with those working midnight and afternoon shifts, being on average, 6 years younger than day shift workers. Similarly injury rates were significantly associated with age; the injury rate for those in the lowest tertile of age was nearly 5 times higher (IRR =4.88, p=0.003) compared to those in the highest tertile, while the rate in the middle tertile was nearly 3 times higher than the rate for older participants (IRR=2.7, p=0.060).

Conclusion: Results of this study show that although midnight shift workers may have a relatively higher injury incidence rate compared to day workers, the association is largely explained by age. Age is relevant because younger less senior officers are more likely to be assigned to night shifts. Fatigue, sleep deprivation, or hazardous police encounters may contribute. Further research is necessary.

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