356 Pharmaceutical Drug Poisoning After Deregulation of Over-the-Counter Drugs Sales: Emergency Department Based Injury In-Depth Injury Surveillance

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Study Objectives: The Korean government approved selected nonprescription drugs (over-the-counter drug; OTC drug) to be distributed in convenience stores from 15. Nov. 2012. The aim of this study is to describe the changes of incidence and the clinical outcome of acute therapeutic drug poisoning after the deregulation of OTC drugs sales.

Methods: We surveyed the data of Emergency Department based Injury In-depth Injury Surveillance (EDIIS), Korea Centers for Disease Control and Prevention, from 2011 to 2014, retrospectively. We included the patients whose mechanism of injury is the poisoning by pharmaceutical drugs. We surveyed the age, sex, intention, alcohol association and pharmaceutical drugs resulting acute poisoning. We surveyed the clinical outcomes in emergency department (ED) and the admission rate of intensive care unit (ICU). We analyzed the changes of the clinical characteristics of Acetaminophen (AAP) and other therapeutic drug poisoning patients after the deregulation of OTC drugs sales.

Results: The poisoning by pharmaceutical drug were 10,162 patients. Acute poisoning by AAP and other drugs were 1,015(10.0%) and 9,147(90.0%) patients, respectively. In AAP and other drug poisoning, age, sex, intention and association with alcohol showed no difference before and after the deregulation. After the deregulation of OTC drugs sales, acute poisoning by other drugs increased from 4,385 to 4,762 patients but acute poisoning by AAP decreased from 538 to 477 patients ($p<0.05$). The rate of admission and transfer in AAP poisoning increased from 36.1% (193/538) to 46.8% (223/477) and the admission rate of intensive care unit (ICU) in AAP poisoning increased from 14.0% (25/179) to 26.0% (54/208) after the deregulation of OTC drugs sales ($p<0.05$).

Conclusions: Since the deregulation of OTC drugs sales, pharmaceutical drug poisoning increased but AAP poisoning decreased. The rate of admission and ICU by AAP and other drug poisoning also increased.

357 Climate Change and Snakebites in California, 1997 to 2017

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Study Objectives: The global climate change effect on flora and fauna has been scientifically documented, but the effect of drought and precipitation changes on North American snakebites is unknown. This study's objective was to correlate snakebite incidence with weather and climate changes in California over 20 years.

Methods: A retrospective analysis of all snakebite exposures reported to the Californian Poison Control System from 1997 to 2017. Demographics, morbidity, and envenomation variables were cohorted by caller zip code as a proxy for county-based incidence, and then correlated 6 separate databases containing: climate and weather data, air temperature, precipitation, population data, eco-regions, and land characteristics. These data were temporally and spatially aligned to provide aggregate incidence within land type, and adjusted for population to calculate incidence per million individuals. Time series modeling was performed using seasonal decomposition by Loess curve fitting. Dynamic linear lagged time series regression was used to develop predictive models between snakebite incidence and weather covariates. Multiple linear regression was used to explore how environmental and demographic variables in each county-year combination may have contributed to the incidence of envenomations.

Results: There were 5,365 reported snakebites during the study period, with a median age of 37 years (22 - 51) with 76% male ($p < 0.001$, 95% CI 76% to 78%). For patients between 20 - 30 years old, the male to female ratio was 5:1; 2:1 in all ages. Most envenomation outcomes were coded as minor (1363, 25%) or moderate (2607, 49%), with 3 deaths. Among the 3580 (67%) of reports with detailed treatment data, the most common intervention was FAB antibody (59%). Adjusted for population, the annualized incidence of snakebites did not significantly change during the study period (rho = -0.11, $p = 0.65$). The snakebite incidence per million people appeared to rise after a period of no drought and declined during periods of drought ($r = -0.41$, p-value < 0.01). Snakebite incidence decreased by 6 month prior drought (- 3.8% for each 10% increase in drought), and increased by 18 month prior precipitation (+ 3.9% for each 10% increase in precipitation).

Conclusions: Weather patterns appear to have a significant and predictive effect on snakebites in California. Snakebite incidence decreased following drought, and increased after precipitation. Awareness of these trends may assist the public with seasonal snakebite risk assessment, and medical providers with preparation and appropriate resource allocations.

358 Withdrawn

359 Determination of the Carboxyhemoglobin Half Life in Carbon Monoxide Poisoned Patients Treated With High Flow Nasal Cannula Therapy

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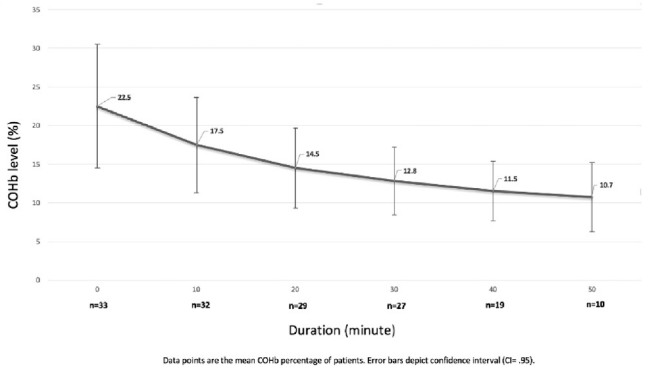
Study Objectives: Acute carbon monoxide poisoning is a common environmental emergency worldwide. Treatment options are limited to normobaric oxygen therapy with a non-breather face mask and hyperbaric oxygen therapy. The aim of this study is to determine the half-life of carboxyhemoglobin with a high flow nasal cannula in adult patients admitted to the emergency department with acute carbon monoxide poisoning. Device tolerability and patient comfort with the high flow nasal cannula were also evaluated.

Methods: This study was conducted between January 2017 and February 2018 in 2 academic emergency departments. Venous blood samples were obtained at 10 minute intervals to determine the rate of elimination of the carbon monoxide. Patient comfort was evaluated by verbal numeric rating scale. Device tolerability was evaluated by patient requests to change the flow rate or flow temperature. The primary outcome was the determination of the half-life of carboxyhemoglobin with a high flow nasal cannula. The secondary outcome was the device tolerability and patient comfort with the high flow nasal cannula.

Results: After excluding 6 of 39 patients, a total of 33 patients were analyzed in the study. The mean baseline COHb level of the 33 patients was 22.5% (SD 8%). The mean half-life of carboxyhemoglobin was determined as 36.76 minutes (SD 9.26 min) with a high flow nasal cannula. COHb levels were halved during the first 40 minutes in 22 (66.7%) of the study patients. Twenty of the patients did not report intolerance to a high flow, with a median verbal numeric rating score of 10. Among the 11 patients who requested a change in the flow rate, the median verbal numeric rating score was 7. After decreasing the flow rate, the median verbal numeric rating score became 9.

Conclusions: The high flow nasal cannula is an easy, safe and comfortable method to treat acute CO poisoned patients which is effective in reducing COHb half-life. HFNC may be a promising alternative method if it is validated as effective with larger studies with clinical outcomes.



Data points are the mean COHb percentage of patients. Error bars depict confidence interval (CI=.95).