

Cannabis Use and Cannabinoid Hyperemesis Syndrome in New Mexico, 2010-2015

Marijuana is the most commonly used illicit drug in the United States (22.2 million people have used it in the past month) according to the 2015 National Survey on Drug Use and Health.¹ Marijuana use is more prevalent among males compared to females and more likely to be used by adolescents and young adults.² The overall prevalence of marijuana use has remained stable in the United States at 4%, but the prevalence of cannabis related disorders has continued to increase.³ As of December 2016, more than half of all states in the United States have a law legalizing marijuana for recreational or medical use.⁴ In 2007, New Mexico became the 12th state to allow the use of cannabis for medical use with the Lynn and Erin Compassionate Use Act.

Cannabinoid Hyperemesis Syndrome (CHS) was first described in 2004 by Allen and colleagues⁵ and is characterized by chronic cannabis use, cyclic episodes of nausea and vomiting, and the learned behavior of hot bathing.^{5,6} A number of case reports have described patients with chronic marijuana use presenting to healthcare facilities with abdominal pain, cyclic vomiting, and compulsive showering, but there are few epidemiologic studies that have analyzed the association between marijuana use and CHS.

In this analysis, emergency department data from 2010-2015 was analyzed for CHS cases. The primary objective of this study was to describe the prevalence of CHS over a 6-year time period in New Mexico. A secondary objective was to compare any CHS trends observed in New Mexico to national estimates.

Methods

This study is a retrospective analysis of emergency department (ED) data from hospitals across the state of New Mexico. This data consists of ED visits from 36 non-federal hospitals. Data elements included in this dataset include patient characteristics including age, sex, and patient residence information as well as visit

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characteristics including +/- 48 diagnosis fields and visit and discharge information (dates and times).

Six years of New Mexico ED data were analyzed (2010-2015) with an average of 765,000 visits per year. For this analysis, the following ICD-9-CM and ICD-10-CM codes were used: *Cannabis Related Diagnosis Codes* [ICD-9-CM: 304.3, 304.30, 304.31, 305.20, 305.21; ICD-10-CM: F12.10, F12.2, F12.20, F12.9, F12.90] and *Persistent Vomiting* [ICD-9-CM: 536.2; ICD-10-CM: R11.10]. A CHS case was defined as an ED visit with a cannabis related diagnosis code and a persistent vomiting diagnosis code.

For national estimates of ED visits, five years of emergency department data were analyzed (2010-2014) using the Nationwide Emergency Department Sample (NEDS), Healthcare Cost and Utilization Project (HCUP), Agency for Healthcare Research and Quality. The NEDS dataset contains ED data from 30 states with approximately 30 million ED visits each year. The NEDS dataset can be weighted to yield national estimates.

Results

The annual number of total ED visits increased by 24.2% from 2010 to 2015 in New Mexico (Figure 1). During this six-year period, the annual number of ED visits increased for cannabis by 172.8% and for CHS by 585.7%. On the national level, total estimated ED visits increased 6.9% from 2010 to 2014 (same period in New Mexico saw a 23.6% increase). National estimates of ED visits increased for cannabis 71.9% and for CHS 423.3%.

In New Mexico, those with CHS visits were more likely to be male, between the age of 18-29 years, and re-

side in the Northeast region of the state. Those with visits for cannabis were more likely to be male, between the age of 30-64 years, and also reside in the Northeast region of the state. For every year of ED data, all four age groups (0-17, 18-29, 30-64, and 65+ years) have seen increases in the number of visits for cannabis. The counties with the highest number of CHS visits in 2015 were Santa Fe, Taos, Bernalillo, and Sandoval. On a national level, CHS visits were more likely among males and those between the ages of 30-64 years. Visits for cannabis followed a similar pattern.

The number of visits for cannabis have been steadily increasing from 2010-2015, with a very large increase from 2014-2015 (Figure 2). A similar trend was observed for CHS visits. Visits for vomiting decreased in 2012, but then increased from 2013-2015, with a similar large increase from 2014-2015 as observed for both cannabis and CHS visits.

The number of patients admitted for CHS increased with each year. On average, each patient visited 1.5 times for CHS. Evaluating CHS and cannabis only visits together, patients visited roughly 2 times per year (the range was 0-5 additional visits).

Discussion

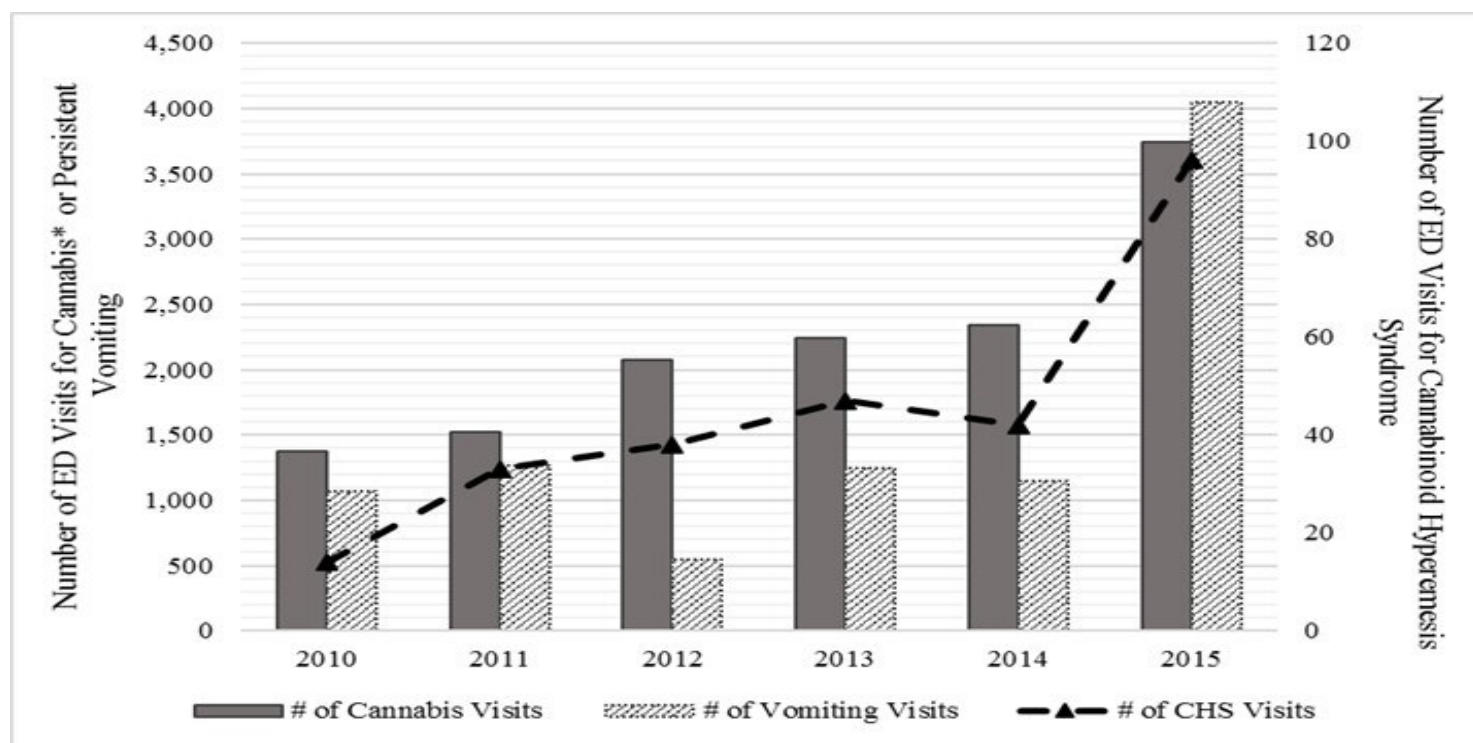
In this analysis, we found that the number of ED visits

for patients presenting with CHS symptoms has increased from 2010 to 2015. Both the number of patients per year and the number of visits have increased, with an average of 1.5 annual visits per patient. Patients presenting with CHS symptoms were more likely to be male and between the age of 18-29 years. New Mexico CHS patients differ from national CHS patients as New Mexico patients are younger in age.

In an analysis of ED visits from two large Colorado hospitals from 2008-2011, Kim et. al¹⁶ found that the prevalence of cyclic vomiting ED visits doubled after marijuana liberalization in the state. Of the patients admitted for cyclic vomiting, marijuana use was more likely documented after medical cannabis use legislation went into effect (October 19, 2009). Cyclic vomiting and CHS are very similar syndromes with the main difference being a history of cannabis use among CHS patients.¹⁷

The increase in the number of visits for CHS is concerning as this may just be the tip of iceberg in regards to ED visit numbers. Studies have shown that there is a delay in the onset of vomiting illness in chronic cannabis users. The delay could be 1-2 years before a CHS patient experiences heavy nausea, vomiting, and abdominal pain. Hot showering or bathing can bring temporary relief to CHS patients, but only cessation of cannabis use will cure the patient.^{17,18} Those patients

Figure 2. Annual Number of ED Visits for Cannabis, Persistent Vomiting, and CHS for NM Residents, 2010-2015



that return to chronic cannabis use after a period of cessation have the potential for relapse. Not all chronic users of cannabis will develop CHS.¹⁸

Most likely the national estimate is an underestimate of the number of visits for both cannabis and CHS. Of the 30 states that participate in NEDS, Colorado and Washington are not included. Both states have recreational marijuana laws that went into effect in 2012. Of the 9 jurisdictions that have recreational marijuana laws (Alaska, California, Colorado, Maine, Massachusetts, Nevada, Oregon, Washington, and Washington D.C), only Colorado and Washington had laws that were enacted prior to 2015. Of the 29 jurisdictions that have medical marijuana laws, only 16 are included in the NEDS dataset and had laws enacted prior to 2015. Key states are missing from the NEDS dataset that would be useful in estimating the national prevalence of CHS.

Recommendations

Currently cannabis is only legally available to individuals with a medical need in New Mexico, but Colorado permits New Mexico residents to purchase cannabis in Colorado. Many states are moving to recreational use of cannabis and more states could adopt recreational use legislation. With the increasing availability and potential relaxing of legal restrictions on cannabis, recognition of CHS patients by healthcare staff is paramount to reducing healthcare costs. Diagnosing CHS can be difficult as persistent vomiting with no clear cause necessitates multiple expensive and invasive medical procedures. Education of healthcare personnel will assist with identifying and treating CHS patients, which will ultimately lower healthcare costs.

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Figure 1. Annual Number of Total ED Visits and ED Visits for Cannabis for NM Residents, 2010-2015

