University of New Mexico
UNM Digital Repository

2020 Pediatric Research Forum Poster Session | Annual Pediatric Research Forum Poster Sessions

9-17-2020

Effects of Race/Ethnicity on appendicitis pain management

Alfonso Belmonte

Christal Chow

Maria Heubeck

Deirdre Hill

Harry Snow

Follow this and additional works at: https://digitalrepository.unm.edu/hsc_2020_pediatric_research

 Part of the Pediatrics Commons

Recommended Citation

Belmonte, Alfonso; Christal Chow; Maria Heubeck; Deirdre Hill; and Harry Snow. "Effects of Race/Ethnicity on appendicitis pain management." (2020). https://digitalrepository.unm.edu/hsc_2020_pediatric_research/21

This Poster is brought to you for free and open access by the Annual Pediatric Research Forum Poster Sessions at UNM Digital Repository. It has been accepted for inclusion in 2020 Pediatric Research Forum Poster Session by an authorized administrator of UNM Digital Repository. For more information, please contact amywinter@unm.edu, lsloane@salud.unm.edu, sarahrk@unm.edu.

Effects of Race/Ethnicity on appendicitis pain management

Alfonso Belmonte, Christal Chow, Maria Heubeck, Deirdre Hill, Harry Snow
Alfonso Belmonte, ABelmonte@salud.unm.edu

Background

Race is a well-researched factor that contributes to variation in care of multiple diagnoses such as asthma, antibiotic prescribing, and pain control. This is also true for appendicitis. As the 6th most common cause for inpatient stay, it costs on average of $7,800 per patient. Despite efforts to standardize care, race and ethnicity continue to play a role in treatment and outcomes on pediatric appendicitis.

We hope to further explore the effects that race/ethnicity have in medical care, diagnosis and complications of acute pediatric appendicitis. We hope that identifying these effects will help providers to actively address race/ethnic health disparities in the management of appendicitis.

Objectives

Determine if race/ethnicity has an affect on the time to receiving pain medications (any medication, non-opiate, or opiate pain medication).

Methods

We performed a retrospective cohort review of Cerner HealthFacts from 2008-2018. Inclusion criteria included acute appendicitis and age 4-18. Exclusion criteria included chronic comorbidities that may potentially mimic appendicitis and any admission to the ICU setting.

Of the cases that meet inclusion criteria, we evaluated preoperative pain control (ie: type of medication prescribed and timing of medication given); the rate of imaging modality performed; and rate of ruptured appendix among race/ethnicity groups.

Descriptive statistics were used to characterize eligible patients by demographics, type of institution (academic/non-academic), and insurance type (private vs. public vs uninsured). Analgesia received prior to appendicitis treatment, time from admission to prescription order, from order to patient receipt, or total time from admission to receipt was enumerated by race, institution type, and insurance. Prescribed medication was categorized according to opiate vs. non-opiate received. Time from any pain assessment or a positive pain assessment to medication receipt was similarly characterized. Imaging, including details by modality (ultrasound, CT, MRI) and appendix rupture (yes/no) were also analyzed.

Multivariable models with adjustment for confounding by age (continuous) and sex were fit. Relative risks (RR) by race for binary outcomes were calculated with 95% confidence intervals (CI), using Caucasian race as the reference group. For continuous outcomes, analysis of covariance was conducted, with p-values indicating differences by race with comparison to Caucasians. All statistical tests used an alpha = .05. All analyses were conducted using Statistical Analysis Systems (SAS) software, v. 9.4 (Cary, N. Carolina).

Results

Table 1: Demographics

Sex	n	Race	n
Male	20762	African American	2803
Female	13713	Asian/Asian Pacific/Pacific Islander	491
		Caucasian	23852
		Hispanic	1986
		Mid Eastern Indian	10
		Native American	659
		Unknown/Other	5235
		Total Non-Caucasian	11184
		Total	35036

Table 2: p-values for differences in mean time from admission to prescription of pain medication, Caucasian as reference

	All	Opiates	Non-Opiates
Caucasian	REF	REF	REF
African American	0.06	0.15	.01*
Asian/Pacific Isl	0.65	0.66	0.28
Hispanic	0.48	0.59	.01**
Native American	0.47	0.79	0.62
Other/Unk	0.6	0.47	0.36
Non-Caucasian	0.33	0.39	0.75

Table 3: p-values for differences in mean time from prescription to administration of pain medication, Caucasian as reference

	All	Opiates	Non-Opiates
Caucasian	REF	REF	REF
African American	0.3	0.22	0.3
Asian/Pacific Isl	0.94	0.92	0.19
Hispanic	0.08	0.06	0.12
Native American	0.19	0.12	0.3
Other/Unk	0.19	.04*	0.45
Non-Caucasian	.03*	.01*	0.18

Table 4: p-values for differences in mean time from admission to receipt of pain medication

	All	Opiates	Non-Opiates
Caucasian	REF	REF	REF
African American	.03*	0.06	.01*
Asian/Pacific Isl	0.62	0.63	0.6
Hispanic	0.78	0.99	.04**
Native American	0.29	0.47	0.99
Other/Unk	0.38	0.18	0.53
Non-Caucasian	0.12	0.08	0.73

Table 5: p-values for differences in mean time from positive pain assessment to receipt of pain medication

	All	Opiates	Non-Opiates
Caucasian	REF	REF	REF
African American	.01*	.01*	.01*
Asian/Pacific Isl	0.48	0.59	0.29
Hispanic	0.58	0.97	0.74
Native American	.02*	0.69	0.93
Other/Unk	0.15	0.07	0.45
Non-Caucasian	.01*	.04*	0.38

*Longer time, relative to Caucasians **Less time, relative to Caucasians

Discussion

Our study looked at various timing aspects of pain medications in the setting of known appendicitis, specifically, the mean time difference from admission to prescription of pain medication, mean time from prescription to administration of pain medication, mean time from admission to receipt of pain medication, and time from positive pain assessment to receipt of pain medication. Caucasian was used as the reference data and the data was categorized by race/ethnicity as well as type of pain medication that was prescribed or administered (any pain medication, opiates only, or non-opiates only). In this case, opiate medications included codeine, fentanyl, hydrocodone, hydromorphone, meperidine, malbuphine, oxycodone, paregoric, pentazocine, tramadol; and non-opiate medications included acetaminophen, paracemtamol, ibuprofen, ketorolac, Celecoxib, Choline magnesium trisalicylate, diclofenac, diflunisal, Etodolac, Indomethacin, magnesium slaicylate, meclofenamate, mefenamic acid, Meloxicam, naproxen, oxaprozin, piroxicam, sulindac, toletin.

It is interesting to note that in the African American group, relative to the reference Caucasian group, it took longer for a provider to prescribe non-opiate medications as well as longer to then receive non-opiate medications after admission. In addition, once a positive pain assessment was documented, it took longer to receive any type of pain medication (opiate and non-opiate), than compared to the reference group. Overall, African Americans will wait longer from time of admission or time of document positive pain assessment to receive any kind of pain medication.

Another interesting fact that has not been, to our knowledge, previously documented is the Native American group. Our results have indicated that Native Americans will also wait longer than the reference group to receive any type of pain medication after a positive pain assessment has been documented. This is also true of non-Caucasian ethnicities.

An unexpected result, once the medication has been prescribed, Hispanic minorities are more likely to receive non-opiate medications faster than the reference group. However, it is important to note that Health Facts has a well recognized under reporting of Hispanic populations. According to the 2010 census, the Hispanic population consisted of 18.5%, compared to 5.7% of our sample, which can bias our results in this population.

Next steps include the evaluation of the rate of imaging modality performed and rate of ruptured appendix among race/ethnicity groups.

References

Barrett ML, Hines AL, Andrews RM. Trends in Rates of Perforated Appendix, 2001–2010. HCUP Statistical Brief #159. July 2013. Agency for Healthcare Research and Quality, Rockville, MD.

Boudreaux ED, Emond SD, Clark S, Camargo CA Jr. Race/ethnicity and asthma among children presenting to the emergency department: differences in disease severity and management. Pediatrics. 2003 May;111(5 pt 1):e615–21.

Goyal MK, Kuppermann N, Cleary SD, Teach SJ, Chamberlain JM, Racial Disparities in Pain Management of Children with Appendicitis in Emergency Departments. JAMA Pediatr. 2015 Nov;169(11):996–1002.

Jeffrey S. Gerber, Priya A. Prasad, A. Russell Localio, Alexander G. Fiks, Robert W. Grundmeier, Louis M. Bell, Richard C. Wasserman, David M. Rubin, Ron Keren, Theoklis E. Zaoutis. Racial Differences in Antibiotic Prescribing by Primary Care Pediatricians. Pediatrics. 2013 Apr;131(4):677-84.

Levas MN. et al. Effect of Hispanic Ethnicity and Language Barriers on Appendiceal Perforation Rates and Imaging in Children. J Pediatr. 2014 Jun;164(6):1286-91.e2.

Steward KA, Higgins PC, McLaughlin CG, Williams TV, Granger E, Croghan TW. Differences in Prevalence, Treatment, and Outcomes of Asthma Among a Diverse Population of Children With Equal Access to Care: Findings From a Study in the Military Health System. Arch Pediatr Adolesc Med. 2010;164(8):720-726.

Disclosure: Authors of this presentation have the following to disclose concerning possible financial or personal relationships with commercial entities that may have a direct or indirect interest in the subject matter of this presentation:

- Alfonso Belmonte – nothing to disclose
- Source of Funding: Pediatric RAC Grant