Making it Complicated: Does Disparity in Access to Care Lead to More Perforated Appendicitis?

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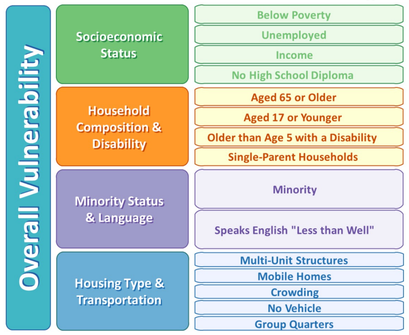
BACKGROUND

- Social determinants of health previously observed to be associated with increased emergent presentation for cholecystectomy and colorectal surgery.
- Appendectomies in top 7 major EGS procedures contributing to healthcare burden → Perforated appendicitis increases morbidity and mortality.
- Social Vulnerability Index (SVI) is a tool developed by CDC adapted to help predict surgical outcomes & identify high risk populations for various surgical conditions.

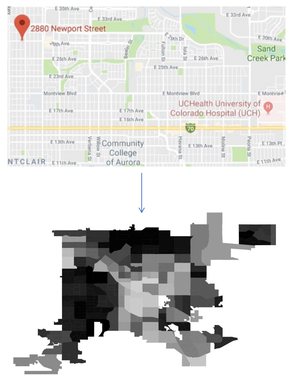
H_1: Increased social vulnerability is associated with increased incidence of perforated appendicitis.

METHODS

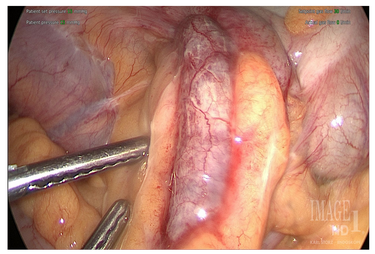
- Retrospective review of patients presenting with appendicitis Nov. 2019 – Jul. 2020.
  - Perforated (n=48) vs Non-perforated (n=142)
  - Duration of symptom: <24hrs, 24-48hrs, 48-72hrs, >72hrs.
- SVI calculated with geocoding at census tract.



*Percentile Rank (0-100)



RESULTS



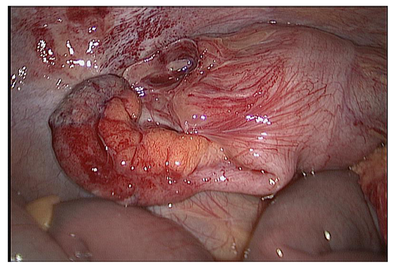


Table 2 – Comparison of patients with perforated versus non-perforated appendicitis

	Perforated appendicitis ($n = 48$)	Non-perforated appendicitis ($n = 142$)	P-value
Male, *n* (%)	24 (50.0)	61 (43.0)	0.50
Age in years, median [IQR]	46 [31 – 55]	34 [27 – 44]	0.004
BMI, median [IQR]	26 [23 – 30]	27 [24 – 31]	0.52
Race/ethnicity, *n* (%)			0.24
Caucasian	16 (33.3)	53 (37.3)	
Hispanic	17 (35.4)	61 (43.0)	
Black	8 (16.7)	10 (7.0)	
Other	7 (14.6)	18 (12.7)	
Need interpreter, *n* (%)	15 (31.2)	37 (26.1)	0.61
Have a PCP, *n* (%)	32 (66.6)	70 (49.3)	0.06
Insurance type, *n* (%)			0.17
Private	16 (33.3)	67 (47.2)	
Public	25 (52.1)	53 (37.3)	
None	7 (14.6)	22 (15.5)	
Estimated income in dollars, median [IQR]	23,027 [17,512 – 29,942]	25,102 [17,512 – 32,087]	0.50
Social vulnerability index (SVI), median [IQR]			
SVI overall	74 [39 – 94]	71 [38 – 88]	0.60
SVI theme 1 (socioeconomic status)	79 [46 – 94]	66 [41 – 94]	0.64
SVI theme 2 (household/disability)	63 [36 – 81]	60 [28 – 77]	0.31
SVI theme 3 (minority/language)	89 [68 – 95]	88 [61 - 96]	0.86
SVI theme 4 (housing/transportation)	51 [30 – 86]	53 [30 - 8]	0.66

Table 3 – Comparison of older patients (over 40 years) with perforated versus non-perforated appendicitis.

	Perforated appendicitis ($n = 28$)	Non-perforated appendicitis ($n = 52$)	P-value
Male, *n* (%)	13 (46.4)	24 (46.2)	1.00
Age in years, median [IQR]	54 [49 – 66]	53 [44 – 62]	0.13
BMI, median [IQR]	27 [24 – 31]	28 [24 – 32]	0.70
Race/ethnicity, *n* (%)			0.18
Caucasian	11 (39.3)	26 (50.0)	
Hispanic	6 (21.4)	15 (28.8)	
Black	6 (21.4)	3 (5.8)	
Other	5 (17.9)	8 (15.4)	
Need interpreter, *n* (%)	7 (25.0)	14 (26.9)	1.00
Have a PCP, *n* (%)	20 (71.4)	35 (67.3)	0.90
Insurance type, *n* (%)			0.70
Private	12 (42.9)	26 (50.0)	
Public	14 (50.0)	21 (40.4)	
None	2 (7.1)	5 (9.6)	
Estimated income in dollars, median [IQR]	22,209 [17,693 – 30,618]	26,434 [20,612 – 42,610]	0.05
Social vulnerability index (SVI), median [IQR]			
SVI overall	69 [43 – 87]	48 [24 – 72]	0.04
SVI theme 1 (socioeconomic status)	72 [46 – 93]	55 [21 – 79]	0.04
SVI theme 2 (household/disability)	63 [45 – 84]	47 [22 – 67]	0.01
SVI theme 3 (minority/language)	91 [67 – 95]	74 [52 – 92]	0.13
SVI theme 4 (housing/transportation)	42 [29 – 79]	35 [21 – 54]	0.10

CONCLUSIONS

- Generally, higher SVI is ***not*** associated with increased risk of perforated appendicitis.
- Patients >40 at greater risk of perforation, associated with higher median SVI and lower median household income.
- Perforation associated with greater duration of symptoms not correlated with SVI domains.
- Lack of elective component in appendicitis possible explanation for observations → "no time for social vulnerability to take effect."

LIMITATIONS

- Review limited to single institution caring for wide spectrum of patients with high *AND* low SVI → "Socioeconomic heterogeneity"
- Inability to speak with patients directly restricts opportunity to understand barriers to care.
- Certain SVI domains unobtainable from EMR review

DISCLOSURES

Investigators declare that we have no financial or personal relationship with other people or organizations that could potentially and inappropriately influence this work and its conclusions.