Clinical and Experimental Obstetrics & Gynecology

Clin. Exp. Obstet. Gynecol. **2022**; 49(3): 062
http://doi.org/10.31083/j.ceog4903062

Communication

Impact of Coronavirus Disease 2019 (COVID-19) on emergency department visits for ectopic pregnancies in New York City

Lisa Dabney[1,*], Liza Karotkin[1], Catherine Seaman[1], Jackie Xiang[1], Jaqueline Rozov[1], Elizabeth Kinsey[1], Sarah Andiman[1], Anne Hardart[1]

[1]Mount Sinai Medical Center, Department of Obstetrics and Gynecology, New York City, NY 10019, USA
*Correspondence: Lisa.dabney@mountsinai.org (Lisa Dabney)
Academic Editor: Dubravko Habek
Submitted: 16 November 2021 Revised: 5 January 2022 Accepted: 6 January 2022 Published: 4 March 2022

Abstract

Background: Ectopic pregnancy is a potential cause of morbidity and mortality among women and is a common diagnosis for women presenting to the emergency room. During the height of the COVID-19 pandemic in New York City (NYC) in the spring of 2020, emergency room visits for all non-COVID related health problems appeared to decrease. We examined visits for ectopic pregnancies and pregnancies of unknown location (PUL) in the emergency department (ED) of three NYC hospitals during the height of the early pandemic and compared them to the same months in the prior year. **Methods**: Our study is an IRB-approved retrospective chart review of all patients who presented to the ED with a positive pregnancy test during the months of March–June 2020 (pandemic period) and March–June 2019 (pre-pandemic). Demographic data, history, labs, imaging, number of visits and treatment and outcomes were measured. **Results**: We found that there were 324 ED visits for PUL in 2019 (pre-pandemic) compared to 195 in 2020 (pandemic). Ectopic pregnancies remained somewhat stable and were diagnosed in 59 patients in 2019 and 51 patients in 2020. The percentage of patients diagnosed with ectopic pregnancy increased from 25.1% of all patients with PUL in 2019 to 39% of all patients diagnosed with PUL in 2020. Rates of complications were similar between the two cohorts. **Conclusion**: Although the number of visits to the ED for PUL fell dramatically from the pre-pandemic to the pandemic time period, the number of patients actually diagnosed with ectopic pregnancy was similar between the two time periods.

Keywords: Ectopic pregnancy; Emergency Department; COVID-19

1. Introduction

Ectopic pregnancy is a significant cause of maternal morbidity and mortality among women worldwide and accounts for a large number of gynecologic Emergency Department (ED) visits yearly [1]. During the early months of the COVID-19 pandemic, anecdotal evidence emerged that ED visits for all non-COVID-19 related health problems decreased [2]. Studies have shown a decrease in the number of general gynecological visits to the ED during the height of the pandemic [3]. Other studies examined the rate of ectopic pregnancy during the COVID pandemic [4,5]. Our study focused on emergency room visits for suspected ectopic pregnancy and not just those ultimately diagnosed with ectopic pregnancy.

Many women who are ultimately diagnosed with an ectopic pregnancy, present first with vaginal spotting and are found to be incidentally pregnant. They are given an initial diagnosis of "pregnancy of unknown location" or PUL and are then instructed to have follow up visits tracking beta human chorionic growth hormone (Beta-HCG) testing as well as serial sonograms. Usually only those with an ectopic pregnancy need urgent treatment. The rest will be found to have a miscarriage or a viable pregnancy, and while some miscarriages need urgent treatment, most, along with viable pregnancies, can be managed in non-acute outpatient setting. Follow up of all PULs is critical, however, as it is unclear at initial presentation which patients will turn out to have an ectopic pregnancy.

By focusing on all emergency visits for PUL during the pandemic we sought to examine if fewer patients presenting to the ED led to a greater acuity and morbidity for those who ultimately were diagnosed with ectopic pregnancy. In other words, did the lower number or PUL visits reflect (1) a negative impact on care of women with ectopic pregnancy or (2) the possibility that patients less likely to have a true ectopic avoided the ED?

Our study compared ED visits for patients with pregnancies of unknown location (PUL), ectopic pregnancies, and ruptured ectopic pregnancies in 2019 (pre-pandemic period) to the same time period in 2020 during the height of COVID-19 pandemic in New York City.

2. Material and methods

A retrospective multicenter, IRB-approved, electronic medical chart review was conducted of ED visits at three New York City Hospitals for two time periods: March through June of 2019 (pre-pandemic period) and March through June of 2020 (pandemic period). Study participants were identified through a query of electronic medical records.

Table 1. Results.

	Pre-pandemic period (March–June 2019)	Pandemic period (March–June 2020)	*p* value
# of ED visits for PUL	324	195	<0.0001[§]
# of patients seen for PUL	235	130	0.45[§]
Total # of patients diagnosed with ectopic pregnancy	59	51	
% of patients diagnosed with ectopic	25.1 (59/235)	39.2 (51/130)	0.005[†]
% of patient diagnosed with ectopic in April	28.2 (11/39)	48.0 (12/25)	0.11[†]
Mean # of visits per ectopic	1.66	1.66	
% treated with surgery	55.9 (33/59)	49.0 (25/51)	0.47[§]
% of patients with hemoperitoneum	27.1 (16/59)	39.3 (20/51)	0.18[†]
% patients with public insurance	62.4 (138/221)	56.0 (70/125)	0.24[†]
% patients with private insurance	37.6 (83/221)	44.0 (55/125)	0.24[†]

[§] Using the Chi-square goodness of fit test.

[†] Using the Chi-square test for independence.

In our hospital system, once patients are found to have a pregnancy of unknown location (PUL), they are followed by gynecology residents or attendings until resolution (diagnosed with an ectopic pregnancy, a miscarriage or an intra-uterine pregnancy). The patients can return for follow up in our clinic, private offices or the ED if follow up is after hours. For this reason, many of the patients in our study had multiple trips to the ED for a single episode of follow up for PUL.

A retrospective chart review of ED patients with positive beta-HCG tests was conducted to determine the number of patients diagnosed with a PUL and the number ultimately diagnosed with an ectopic pregnancy. Demographic data, patient medical history, labs, imaging results, treatment plan, number of visits and final diagnosis were documented and analyzed. The proportion of PULs that were true ectopic pregnancies during the pre-pandemic and pandemic periods were compared using Chi square analysis.

3. Outcomes

In the 2019 cohort, there were 324 visits to the ED from patients with a diagnosis of PUL. In the 2020 cohort, the number of visits to the ED for this indication declined to 195. The number of patients seen in the ED with PUL was 235 in the pre-COVID period and 130 during the COVID period (Table 1). Ectopic pregnancies were diagnosed in 25.1% (59/235) of patients in 2019 and in 39.2% (51/130) of patients in 2020 ($p = 0.005$). In April 2020, during the peak of the COVID-19 pandemic, ectopic pregnancy was diagnosed in almost 50% of patients seen for PUL in the ED that month (12/25) (Table 1). Of the patients ultimately diagnosed with an ectopic pregnancy, the rates of surgical and medical management, hemoperitoneum, as well as numbers of ED visits per patient were similar between cohorts (Table 1). The most significant difference between the two cohorts was the number of patients who were seen for a diagnosis of PUL during the pandemic period (Table 1). There was no significant difference in the proportion of women with private vs. public insurance in the two cohorts (Table 1).

4. Discussion

In our study cohort, there were fewer patients presenting to the ED with PUL during the height of the COVID pandemic compared to the year prior. The number of patients who were ultimately diagnosed with an ectopic, however, was similar for both groups. This resulted in a higher percentage of patients with PUL who were ultimately diagnosed with ectopic pregnancy during the time of the COVID surge in New York City.

These differences were likely due to both patient reluctance to enter health care facilities, as well as altered management by physicians in an attempt to reduce risk of COVID exposure for their patients. These results suggest that while hospitals were overwhelmed with providing emergency care to COVID patients, a combination of patient discretion and provider outpatient management of PUL resulted in fewer low acuity emergency department visits for women with PUL. In other words, patients with milder symptoms probably avoided the ED during the height of the COVID epidemic in New York City.

Fortunately, there was no differences in hemoperitoneum between the two groups. These results suggest that decisions made by patients and providers to limit emergency department visits for PUL did not result in increased morbidity or mortality. This finding is in contrast to those in other studies showing excess morbidity from non-COVID causes during the pandemic, likely due to delayed or inaccessible care [6–9].

Unlike other studies examining ectopic pregnancies during the COVID pandemic, we examined all patients presenting to the emergency room with a diagnosis of PUL [4,5,9]. This allowed us to examine how these patients interacted with the health care system during the pandemic.

We found that fewer patients overall presented to the emergency room during the pandemic but the number of patients with ectopic pregnancies did not change. It is unclear why this was the case. Perhaps patients with mild bleeding or pain stayed home and these were the ones who were less likely to have ectopic pregnancies.

We also found that there were no significant differences in insurance status between the two time periods. We were interested if there was going to be a difference in insurance status since anecdotal reports showed that those in wealthier districts may have left New York City during the initial surge of the pandemic [10]. This exodus did not seem to affect the population mix at our hospital system.

Limitations of our study include those inherent in observational studies. The data reflects the experience in three hospitals in NYC, which may not be representative of the rest of NYC or the country in general. However, these three hospitals serve a diverse group of patients with both private and public insurance.

While we did not find a difference in the number of ectopic pregnancies diagnosed during the pandemic compared to pre-pandemic, our numbers for the three hospital sites was small, and there may not have been enough power to determine a difference.

A strength of the study included data collection in a single institution with a single electronic medical record that insured data collection was standardized. Examining all patients with a diagnosis of PUL instead of just examining those with a diagnosis of ectopic allowed us to examine how patients interacted with the emergency rooms during the height of the pandemic.

Our findings have potential implications for streamlining of care for PUL and ectopic pregnancy during both non-pandemic and pandemic conditions. It suggests that patients can be managed with lab tests and sonograms on an outpatient basis instead of in the emergency room. More studies and data with larger numbers of patients would be needed to answer this question.

5. Conclusions

Emergency room visits for PUL decreased dramatically during the height of the COVID-19 pandemic in three New York City hospitals without a decrease in the total number of ectopic pregnancies diagnosed or an increase in morbidity of these patients.

Author contributions

LD, AH, EK and SA designed the research study. LD, LK, CS, EK, JX and JR performed the data collection. LK and CS analyzed the data. LK, SA, LD, JR and AH wrote the manuscript. All authors contributed to editorial changes in the manuscript. All authors read and approved the final manuscript.

Ethics approval and consent to participate

This study was approved as a retrospective chart review by the IRB of Mount Sinai Hospital on July 9, 2020. The assigned number is 20-00706. Study participants were identified through a query of electronic medical records.

Acknowledgment

Not applicable.

Funding

This research received no external funding.

Conflict of interest

The authors declare no conflict of interest.

References

[1] Creanga AA, Syverson C, Seed K, Callaghan WM. Pregnancy-Related Mortality in the United States, 2011–2013. Obstetrics & Gynecology. 2017; 130: 366–373.

[2] Hartnett KP, Kite-Powell A, DeVies J, Coletta MA, Boehmer TK, Adjemian J, *et al*. Impact of the COVID-19 Pandemic on Emergency Department Visits - United States, January 1, 2019–May 30, 2020. MMWR. Morbidity and Mortality Weekly Report. 2020; 69: 699–704.

[3] Abel MK, Alavi MX, Tierney C, Weintraub MR, Avins A, Zaritsky E. Coronavirus Disease 2019 (COVID-19) and the Incidence of Obstetric and Gynecologic Emergency Department Visits in an Integrated Health Care System. Obstetrics & Gynecology. 2021; 137: 581–583.

[4] Dell'Utri C, Manzoni E, Cipriani S, Spizzico C, Dell'Acqua A, Barbara G, *et al*. Effects of SARS Cov-2 epidemic on the obstetrical and gynecological emergency service accesses. What happened and what shall we expect now? European Journal of Obstetrics & Gynecology and Reproductive Biology. 2020; 254: 64–68.

[5] Anteby M, Van Mil L, Michaan N, Laskov I, Grisaru D. Effects of the Covid-19 pandemic on timely care for extrauterine pregnancy, a retrospective analysis, The Lancet Regional Health. 2021; 2: 100026.

[6] Erol MK, Kayıkçıoğlu M, Kılıçkap M, Güler A, Yıldırım A, Kahraman F. Treatment Delays and in-Hospital Outcomes in Acute Myocardial Infarction during the Covid-19 Pandemic: a Nationwide Study. The Anatolian Journal of Cardiology. 2020; 24: 334–342.

[7] Sharma R, Kuohn LR, Weinberger DM, Warren JL, Sansing LH, Jasne A, *et al*. Excess Cerebrovascular Mortality in the United States during the COVID-19 Pandemic. Stroke. 2021; 52: 563–572.

[8] Toma HV, Bank TC, Hoffman MK. Care for Women with Ectopic Pregnancies during the Coronavirus Disease 2019 (COVID-19) Pandemic. Obstetrics & Gynecology. 2021; 137: 1041–1042.

[9] Dvash S, Cuckle H, Smorgick N, Vaknin Z, Padoa A, Maymon R. Increase rate of ruptured tubal ectopic pregnancy during the COVID-19 pandemic. European Journal of Obstetrics & Gynecology and Reproductive Biology. 2021; 259: 95–99.

[10] Quealy K, The Richest Neighborhoods Emptied Out Most as Coronavirus Hit New York City. The New York Times. 2020. Available at: https://www.nytimes.com/interactive/2020/05/15/upshot/who-left-new-york-coronavirus.html (Accessed: 15 May 2020).